Cumulative Quantitative Risk Assessment of an Oil and Gas Industrial Site: A Case Study

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Abstract

Quantitative Risk Assessment (QRA) is an important technique for safety assessment, planning and decision making in the process industries. Both regulatory authorities and companies use it to assess risks on existing and planned developments. Atkins has recently conducted a QRA for an Oil and Gas Industrial Site.

The industrial site has several existing Oil and Gas processing facilities operated by several local/national and international oil & gas operating companies. The site is a major component of the country’s energy and economic infrastructure, acting as a centralized location for collection and treatment of locally produced oil and natural gas prior to their distribution, both locally and internationally. The facilities on the site include slug catchers, tank farms, several onshore oil wells, and a number of buried pipelines.

Atkins has developed an in-house QRA software tool called “RiskTool”. RiskTool has been developed to calculate the individual and societal risks associated with toxic releases, thermal radiation and blast overpressure from major hazards associated with the site facilities. RiskTool enable to readily determine the contribution from different scenarios to identify the key risk drivers. The QRA determined the risks to people due to each individual facility on the site and also to the site as a whole. QRA frequency modeling and consequence modeling was conducted for each scenario and integrated into RiskTool along with the Geographical Information System (GIS) Map to provide a spatial view of the facility risk.

This paper discusses those aspects of the project that made it unique and provides insights on executing an integrated cumulative QRA for a large industrial site.

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